

CROP PRODUCTION NEWS

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C R O P S

Editor's Comments

By Faye Dokken-Bouchard, PAg, Crops Branch

Many of us were exposed to agriculture from "Day One", growing up on a farm or ranch, developing an interest in the science or business of agriculture at an early age. Eventually, that may have led us to further an education in agriculture or landed us that first "real job" as a summer student with an agricultural company or research department. In an industry as large and diverse as agriculture, it is not uncommon to have colleagues and clients who did not experience agriculture at all until university or that first summer job. Even for those of us who did grow up on a farm, exposure to other areas of agriculture through classes and work experience would help forge an unexpected career path. For example, I grew up on a farm in southwestern Saskatchewan in some very dry years; if it wasn't for my first summer job, I would never have learned what plant pathology was! But that is how I found my passion.

The Ministry of Agriculture has employed some great summer students over the years. While they may or may not be continuing on in the field of agriculture, hopefully their experience will carry that appreciation for the industry onto other areas of their lives and careers. To learn about some of our student's experience in the Public Service, please check out <http://youtu.be/ep4t8YrWd7s> and <http://www.youtube.com/watch?v=uzzOPazjq18>.

NOTE: Throughout this document, you will see that some publications are in blue font and underlined, indicating links to website information. If you are reading this on your computer screen, click your cursor on the link to take you directly to the website. ☺

Crop Production News is a bi-weekly publication prepared primarily by provincial specialists with the Crops Branch and Regional Services Branch of the Saskatchewan Ministry of Agriculture. It is a compilation of articles related to entomology, plant pathology, weed science, soils and agronomy issues.

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IN THIS ISSUE:

Crop Protection Laboratory Update	2
Agriculture Knowledge Centre Update	3
Brown Rot Blossom Blight on Sour Cherry	4
Make Note of Plant Diseases at Harvest	6
Those Lentils are Hot, Hot, Hot	8
Harvest Reminders for Oilseed Crops	9
Bertha Armyworm and Other Late Season Insects in Canola	10



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Crop Protection Laboratory Update

By Philip Northover, AAg, Supervisor, Crop Protection Laboratory

Herbicide injury and the lingering effects of the moisture problems in the early season (root rots and poor root development) still represent the bulk of the submissions over the season and particularly the past two weeks. However, there have been some diagnoses that are a departure from past reports. The list below summarizes our identifications in the past two weeks (most of which were submitted/diagnosed multiple times). One insect sample, *Phyllotreta cruciferae* (crucifer flea beetle), was also submitted after being found relaxing in a house.

Plant Diseases and Disorders:

Alfalfa: Yellow blotch (*Leptotrochila medicaginis*) and spring leaf spot (*Phoma medicaginis*)

Barley: Barley Yellow Dwarf Virus and fusarium head blight

Canola: Physical damage (otherwise referred to as "radial tire blight")

Cumin: *Alternaria* spot, *Ascochyta* leaf spot and *Fusarium* root rot

Durum and Flax: Herbicide injury/damage

Peas: Fusarium wilt (*Fusarium oxysporum*)

Soybean: Bacterial blight (*Pseudomonas savastanoi* pvr. *glycinea*)

Wheat: Barley Yellow Dwarf Virus

Canada thistle: Canada Thistle stem gall caused by *Urophora cardui* (stem gall fly) biocontrol agent

Manitoba Maple: Group 4 herbicide damage

Mountain Ash: Nutrient deficiency, drought/salt stress

Tower Poplar: Venturia shoot and leaf blight (*Venturia macularis*)

Hawthorn: Hawthorn Rust (*Gymnosporangium* spp.)

Tomato: Bacterial Spot (*Xanthomonas campestris* pvr. *vesicatoria*)

Sour Cherry: Bacterial Canker (*Pseudomonas syringae* pv. *mors-prunorum*)

Weed Submissions:

Marsh yellow cress (*Rorippa islandica*)

Horseweed (*Conyza canadensis*)

Common mullein (*Verbascum thapsis*) – this sample was seven feet high!

Biennial wormwood (*Artemisia biennis*)

Pennsylvania pellitory (*Parietaria pennsylvanica*)

Goldenrod (*Solidago* spp.)

Dutch Elm Disease submissions have increased significantly in the past two weeks. Symptoms of the disease are more apparent now that prolonged warm and dry periods stress the trees to a much greater extent. To date, 55 per cent of the samples processed have tested positive for the disease. ☼



Figure 1: Stem gall on Canada thistle
Source: Saskatchewan Agriculture

Agriculture Knowledge Centre Update

By Patrick Mooleki, PAg, Soil/Nutrient Management Specialist

The Agriculture Knowledge Centre (AKC) continues to receive calls on a wide range of topics including weed, disease and insect control, weed identification, harvesting considerations, soil productivity and management, and general crop production issues.

The majority of the inquiries on insect control have been in regards to bertha armyworm. Callers wanted to know about the life cycle, scouting, economic thresholds, control options and pre-harvest intervals. A few inquires dealt with diamondback moth larvae, particularly with regards to identification, scouting, distinguishing them from bertha armyworm and determining economic thresholds and control options. Other callers wanted to know more about imported cabbageworm: how much damage they were causing and whether or not there is an economic threshold for their control. Generally, they do not pose much of a threat to canola. For more information on canola insects, see Scott Hartley's article in this edition of CPN.

The majority of weed control calls centred on weed identification and control options. Control of Canada thistle dominated the inquiries in this area. Callers also wanted to know options in chemfallow and unseeded acres. Other inquiries were with regards to pre-harvest weed control in conjunction with crop desiccation.

We also received a few calls on diseases. The majority of calls were related to cereal diseases, particularly wheat rusts and their impact on yield and quality. A few calls dealt with pulse diseases. However, most pulses are well advanced so spraying is not warranted.

Calls on harvesting crops are now picking up. Producers want to know when to swath or desiccate their crops, particularly canola, mustard, peas and lentils. A few callers wanted to know the risks associated with straight-combining canola and mustard.

Inquiries on seeding fall crops were mainly on timing of seeding and field selection. Callers were advised to avoid a "green bridge" that may help pass on wheat streak virus from immature spring wheat to emerging winter wheat. As well, when selecting a field attention should be paid that it has adequate stubble to trap snow.

Soils-related questions included requests on soil classification and productivity, carbon credits, green manure application and general soil fertility. Forage inquiries included questions on source of seed, terminating forage stands, fall seeding, seeding saline sites and pricing forages. ⚙

Brown Rot Blossom Blight on Dwarf Sour Cherry

By Forrest Scharf, PAg, Provincial Specialist, Fruit Crops

In the past, dwarf sour cherry producers located on the Canadian Prairies had to contend with only a couple of diseases: bacterial canker (*Pseudomonas syringae* spp.) and cherry leaf spot (*Coccomyces hiemalis*, also known as *Blumeriella jaapii*). Both diseases have been relatively innocuous and have not been linked to significant economic loss. In fact, cherry diseases were not given much attention until this summer.

The Back Story

A high percentage of dwarf sour cherries survived the winter because hot and dry conditions in October and November 2010 prompted them to shed leaves, harden down and remain dormant until late this spring. This is in contrast to the 2009 and 2010 seasons, when the lack of hardening down caused the plants to sprout too early, resulting in widespread top-kill.

Thus, the cherry trees in most of Saskatchewan were generally in good health coming into 2011. Temperatures were relatively cool through April and May, and this delayed bloom by roughly two weeks, which means that trees flowered after the last frosts. Cherry yields should have been very high in 2011.

So What Happened?

During the post-bloom period in mid-June and early July, a few growers started reporting lower fruit-set than was expected and they wondered if a lack of pollination was affecting yield. The suggestion made sense because honey bees were not observed to be active in the cherry orchards, although hover flies and bumble bees were far more active this year. The general consensus was that a pollination study was desperately needed.

However, photographs of unusual disease symptoms began to be submitted that demanded immediate in-field investigation. Ultimately, the field calls led to the discovery that brown rot blossom blight (also known as American brown rot) was the culprit. Brown rot blossom blight is caused by three closely related fungi: 1) *Monilinia fructicola*, 2) *M. fructigena* and 3) *M. laxa*. The particular species infecting Saskatchewan cherries is likely *M. fructicola*, but *M. laxa* could also be present. *Monilinia fructigena* is not believed to exist in North America.

When the diagnosis was made in mid-July, an information bulletin was sent out to all the known cherry growers in Saskatchewan. Feedback from many growers confirmed that the disease is not isolated to just a few locations.

Monilinia fructicola also infects chokecherry bushes (*Prunus virginiana*) and infection of these shrubs has been observed throughout the Prairies, so it is likely that the inoculum infecting our somewhat isolated sour cherries originated from chokecherry bushes.

(Continued on page 5)

Brown Rot Blossom Blight on Dwarf Sour Cherry (Continued from page 4)

Disease Cycle and Management

Brown rot blossom blight survives winter as sporodochia on mummies (shrivelled infected fruit that cling to trees), blighted blossoms and twigs, as well as in cankers. In spring under cool wet conditions, conidia develop on the infected plant material and are spread via wind and rain to infect blossoms and nearby twigs (see Figure 2).

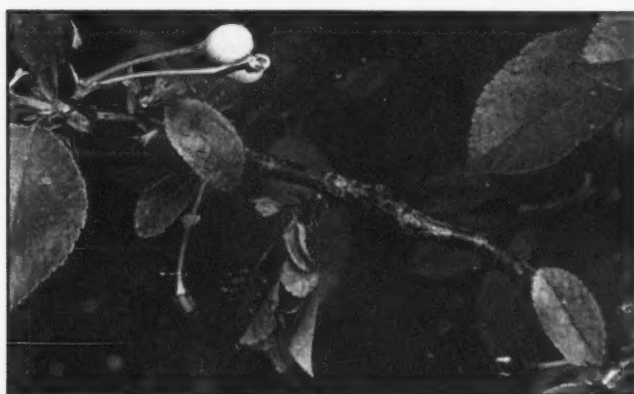


Figure 2: Dwarf sour cherry twig with brown rot blossom blight
Source: Saskatchewan Agriculture

There are several fungicides registered to control this disease, including: Elevate (fenhexamid), Bravo 500 (chlorothalonil), Cabrio (pyraclostrobin), Captan or Maestro (captan), Copper Spray Fungicide (copper oxychloride), Ferbam (ferbam), Indar (fenbuconazole), Kumulus or Microscopic Sulphur (sulphur), Lance (boscalid), Nova (myclobutanil), Pristine (boscalid and pyraclostrobin),

Topas or Propiconazole 250 (propiconazole) and Rovral (iprodione).

The unusually high levels of precipitation in 2010 and early 2011 likely helped spread this disease. Under the wet conditions experienced in the past few years, economic losses from this disease have likely occurred but have gone undiagnosed. Therefore, it is highly recommended that growers make efforts to control this disease in 2012. Timing of spray applications is very critical: growers should ensure they spray in spring when blossoms are exposed, and especially soon after any rains occur.

Keep in mind that disease is not the only stress that dwarf sour cherry producers have to deal with. Cherries are also susceptible to winter-kill of top growth. Usually top-kill results from physical or structural collapse of above-ground vascular tissues caused by desiccation from deep freezing and/or freeze and thaw cycles. The spring freeze/thaw damage is often associated with "sour sap", which occurs under anaerobic conditions when above-ground sap begins to ferment, and is more common in plants infected with bacterial canker. Cherries also suffer "tip-kill" when desiccation of shoot-tips occurs in severely cold and windy winter conditions. Wildlife foraging, mice girdling stems, moles and ground squirrels damaging roots, and plant weakness stemming from susceptibility to soil salinity and iron chlorosis problems are other common problems that result in economic loss.

For more information, please contact Forrest Scharf at: 787-4666 or email forrest.scharf@gov.sk.ca ☼

Make Note of Plant Diseases at Harvest

By Faye Dokken-Bouchard, PAg, Provincial Specialist, Plant Disease

Harvest is a busy time of year. Farmers are preparing equipment, desiccating, swath, combining and even thinking about what to grow next year. Researchers are also busy conducting ratings, gathering data and harvesting plots. For many of the regional and provincial specialists in the Ministry of Agriculture, this is a busy time of year for disease surveys. Although it is now too late to control them, sometimes it is easier to spot diseases late in the season and make a record of what occurred. Using this information regarding plant disease incidence in 2011, we may better plan possible disease management strategies and research initiatives in the future.

It is equally important for farmers to monitor fields and record the latest crop conditions, weather and pest observations from the 2011 season. Although there may be little time for traditional scouting during harvest, a bird's-eye-view from the combine should not be discounted as a practical way to watch for disease. However, if you see problem areas, always take the time to safely disembark the tractor momentarily to take a closer look.

Cereal Diseases (Figure 3)

Leaf spotting diseases and stripe rust are polycyclic diseases. This means they may be controlled after initial symptoms are observed by using a fungicide to prevent additional disease cycles from occurring. However, late in the season when it is too late for a fungicide, these diseases may spread to the heads, causing infection of the glumes (stripe rust or *Septoria glume blotch*) and smudge or black point on the seed (tan spot).

Fusarium head blight is a monocyclic disease. While *Fusarium* is a facultative fungus able to infect all plant parts, wheat is only susceptible to fusarium head blight (FHB) during flowering. Therefore, once you see symptoms it is too late to control. Bleaching of the glumes or fusarium-damaged kernels may be observed before or during harvest. Hail damage after heading may result in symptoms that could be mistaken for FHB. Hail is likely to break plant parts and affect one side of the plants (not just the heads) as well as affecting weeds and other plants in the area. If FHB is the culprit, only the crop will be affected (isolated glumes or all glumes above the point of infection) and there may be pink or orange spore masses.

Ergot also causes infection during flowering but does not appear until maturity. If harvest is delayed and senesced crops are exposed to moist conditions, saprophytic fungi may cause sooty moulds or contamination of seed. Have seed tested to ensure *Fusarium* levels (by FHB or saprophytes) are below threshold for planting.

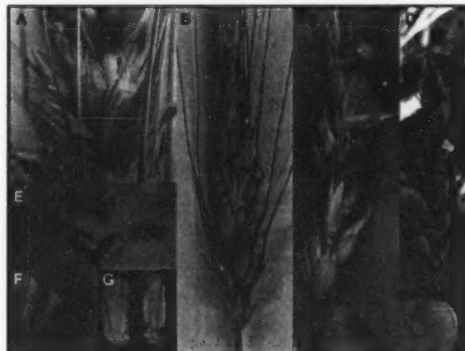


Figure 3: Wheat head/seed diseases/disorders: A) stripe rust, B) fusarium head blight, C) hail damage, D) sooty mould, E) black point, F) ergot, and G) fusarium damaged kernels. Sources: A) Agriculture & Agri-Food Canada; and B) to G) Saskatchewan Agriculture

(Continued on page 7)

Make Note of Plant Diseases at Harvest (Continued from page 6)

Pulse Diseases (Figures 4 and 5)

Pulse crops grown in a region with a history of host-specific diseases, such as ascochyta blight or anthracnose in lentils or the ascochyta complex in peas, will be at great risk of developing diseases under moist conditions. Diseases that affect other crops, such as root rot or sclerotinia white mould, or pathogens that can survive as saprophytes in the absence of a host, such as *Botrytis* and *Stemphylium*, also pose a risk when crops are rank and the weather is moist. These diseases may have been observed earlier in the season, but will continue to be visible and can progress as long as the crop has green living tissue.

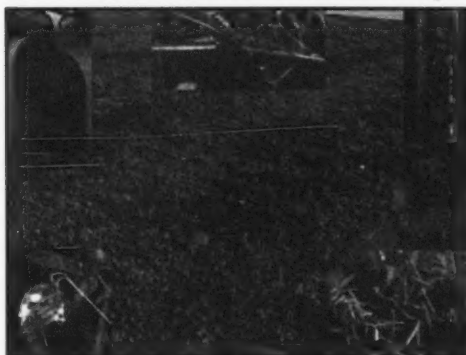


Figure 4: Brown patch affected by various lentil diseases. Watch for (inset clockwise from top left): ascochyta blight, botrytis grey mould, anthracnose, stemphylium blight and sclerotinia white mould.

Source: Saskatchewan Agriculture



Figure 5: Ripening peas will support growth of harmless saprophytic organisms; however if the pods are affected by disease such as ascochyta leaf and pod spot (shown) or mycosphaerella blight, seed testing may reveal infection.

Source: Saskatchewan Agriculture

Canola Diseases (Figures 6 and 7)

As pods are forming, aster yellows may become visible as malformation of pods is more obvious. Discoloured plants or patches of crop should be investigated to differentiate between sclerotinia white mould (most common disease of canola in Saskatchewan surveys), blackleg (less common due to improved resistance but still a risk) or clubroot (symptoms still have not been observed in Saskatchewan). ☼



Figure 6: Discoloured areas of canola crop may reveal sclerotinia stem rot or blackleg

Source: Saskatchewan Agriculture



Figure 7: Clubroot of canola in Alberta. Check yellowed or prematurely ripened areas for galls

Source: Saskatchewan Agriculture

Those Lentils are Hot, Hot, Hot

By Dale Risula, PAg, Provincial Specialist, Special Crops

For the past few weeks, temperatures have soared and held steady at around 30C. This has brought about rapid maturation of lentils and significant harvest progress.

So far, growers are reporting average yields; however, quality is very high. It is important to preserve the quality to maintain lentil marketability. Storage and handling of lentils under these kinds of conditions can be risky. Oxidation of tannin precursors in the seed coat causes lentils to turn brown with age, which reduces quality. High temperature, high moisture and sunlight can speed up this process. These conditions will also increase bin humidity, leading to growth of fungi and development of toxins associated with moulds.

Recommendations are to store lentils in bins to protect them from sunlight and to cool them immediately after binning. Aeration is recommended to cool lentils to approximately 15C as soon as possible. Lentils should also be dried to 14 per cent moisture content for green lentil and 13 per cent moisture content for red lentil. Foreign material that holds moisture should be cleaned from the sample to reduce the possibility of increasing humidity within the bin. Other particles such as fine-grind material that make up dockage in the sample will reduce the aeration system's airflow.



Figure 8: Aeration bin
Source: Saskatchewan Agriculture

At the opposite end of the spectrum, if you are in a cool wet zone, lentils shouldn't be dried too much too quickly. Generally, a decrease of four or five percent moisture or more through a grain dryer can create problems. Lentils should be tempered in between passes to allow them to cool and any moisture to migrate. If lentils are dried too quickly, the seed may develop tiny cracks, which will affect the quality. Lower moisture content also increases the chance of damage during handling.

Aeration bins used to dry wheat will work equally well for lentil, and may even dry more quickly. The drying or cooling rate is influenced by the variety (seed size), bin dimensions, fan performance and weather conditions. Close monitoring is recommended.

Table 1. Days required for natural drying of lentils with unheated ambient air¹

Start date	Moisture content (per cent)	Airflow rate (cfm/bu)		
		1.0	2.0	3.0
August 15	20	36	21	6
August 15	17	26	20	17
September 15	20	38	12	10
September 15	17	35	10	9

¹Adapted from Saskatchewan Pulse Growers Pulse Production Manual, 2000

Harvest Reminders for Oilseed Crops

By Venkata Vakulabharanam, PAg, Provincial Specialist, Oilseed Crops

With unprecedented warm weather, harvest has already started in some parts of the province, or is just around the corner. Here are some harvest considerations for oilseeds.

Canola

- Consider pre-harvest intervals (time between pesticide applications and cutting). Once a crop is within seven days of being swathed, no insecticides can be applied.
- Given the type of year we had, some fields have multiple growth stages resulting in uneven maturity. Evaluate your risks and benefits accordingly when deciding when to swath.
- The Canola Council of Canada newsletter *Canola Watch* says that on an average, during early fall days, moisture loss may be about one to two per cent per day. This varies with wet and cool or hot and windy conditions. An approximately 10-per-cent increase in seed colour occurs with about five per cent moisture loss. Therefore, seed colour change from 30 to 50 per cent would require a 10-per-cent drop in moisture. This may take up to 10 days in cool weather but only three days in hot and windy weather (to read *Canola Watch* click here: <http://canolawatch.org/>).
- As most of the seeding was delayed this year, frost is a risk. Damaging frost usually occurs at around three to four degrees below zero. It is important to cut at least two days before the damaging frost occurs, provided the weather for those two days is conducive to dry-down. If you would like to read more on frost and green seed in canola, refer to the Saskatchewan Ministry of Agriculture publication: www.agriculture.gov.sk.ca/Default.aspx?DN=bb79745e-e78a-45af-80e7-79e9b7903a2e
- Keep malathion out of canola bins. Neither canola nor the bins used to store canola can be treated with malathion. Resulting residues in canola will create export problems, as there is either zero or very low tolerance for malathion residues in canola seed in the export markets.



Figure 9: Canola pods before ripening
Source: Saskatchewan Agriculture

(Continued on page 10)

Harvest Reminders for Oilseed Crops (Continued from page 9)

Flax

- Pay attention to pre-harvest intervals. Use glyphosate only when it is needed. We continue to receive questions from export markets with regards to glyphosate residues in flax seed. Furthermore, glyphosate application will seriously harm flax germination, so do not use it on crop intended for seed.
- Test, test, test! According to the Flax Council of Canada's Triffid Stewardship Program, all flax seed intended for planting, as well as flax seed entering the commercial grain handling system, must be tested for the presence of CDC Triffid. Buyers will request testing certificates for both planting seed and production. Also, remember that some flax buyers will only accept test results from certain labs. Check with your buyer prior to testing. For a list of approved testing labs, visit the Flax Council of Canada website (www.flaxcouncil.ca).
- Approved labs will provide producers with a discount of 50 per cent on the cost of testing their production, up to a maximum of \$100 per sample.
- Minimize harvest losses and avoid combining premature or tough bolls.
- Equipment used for flax harvest, storage and transport should be clean. The swather and combine should be cleaned properly before and after harvesting flax. Store your flax crop in a clean bin. Vacuum the bin prior to loading and after unloading to remove every flax seed in the bin. Thoroughly clean vehicles used to transport flax from field to farm and farm to elevator.

Mustard

- Roundup Weathermax was recently registered for preharvest application on condiment mustard through the minor use registration system. However, glyphosate residues can vary based on the time of application and may result in higher-than-acceptable levels of residue in mustard seed. Growers should consult their buyer/processor/exporter prior to such application. See the latest news release regarding this issue on SaskMustard's website (www.saskmustard.ca/grower/news/2011-0803-weathermax.html).
- Straight-combining is the preferred option for high quality mustard and will reduce green seed count. Yellow mustard is the most resistant to pod shattering, followed by Oriental and brown mustard.
- Thoroughly clean harvest, transport and storage equipment. Make sure to reduce insect excreta and body parts, ergot from volunteer cereals, and soft earth pellets and stones.
- To avoid heated seed, harvest mustard below 10 per cent moisture for short-term storage (less than five months) and below nine per cent moisture for longer-term storage. ☼

Bertha Armyworm and Other Late-Season Insects in Canola

By Scott Hartley, PAg, Provincial Specialist, Insect and Vertebrate Pests

Canola producers have faced several insect pests during the 2011 growing season. Control measures may still be required on late crops, but as crops mature insect damage will decrease and control options will be limited. It is important to consider pre-harvest intervals associated with insecticides to maintain acceptable residue levels in the harvested product. For more information on insecticides, refer to the 2011 Guide to Crop Protection (www.agriculture.gov.sk.ca/Guide_to_Crop_Protection). For fact sheets on specific insect pests, including management and economic thresholds, visit the Saskatchewan Ministry of Agriculture website (www.agriculture.gov.sk.ca).

Economic populations of **bertha armyworms** have been reported from the northwest (North Battleford area) to eastern Saskatchewan (Churchbridge, Moosomin), bordering Manitoba. Regular scouting of fields is important to determine if control is required. Often late afternoon and evening will provide the best estimate of bertha armyworm population levels.

Infestations of diamondback moths and insecticide application continue to be reported in several areas. Diamondback moth larvae can debark developing pods, causing seed loss directly through feeding or from premature shattering of the pods. Depending on the population in the field, several factors should be taken into account when considering control measures. If most of the population is in a late larval stage or pupating, control is unlikely to be warranted this season. Heavy rains can wash diamondback moth larvae off plants and drown them. Parasite levels generally increase through the season and can result in a significant drop in diamondback moth numbers.

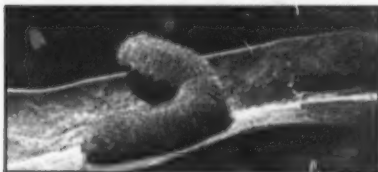


Figure 10: Imported cabbageworm
Source: Wes Anderson, Richardson

Imported cabbageworm is another caterpillar noted in canola in 2011. This is the larval stage of the cabbage butterfly (*Pieris rapae*). This insect is generally of little concern, but high larvae numbers can potentially be a problem if there is little foliage remaining on the plants.

The **cabbage seedpod weevil** is primarily a pest in southwestern Saskatchewan but has been expanding its range to the east and north. Management options include crop rotation or insecticide application in the spring. At this time of year, weevil presence can be noted by the exit holes in pods where larvae have emerged to drop to the ground to enter a pupal stage. Later in the year, the adults will appear and feed on late canola pods. This will be the over-wintering stage of the insect. ☼

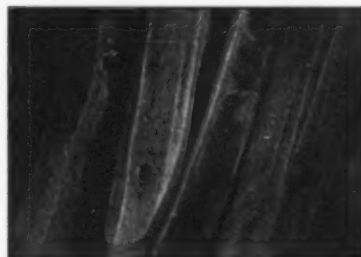


Figure 11: Canola pods with
cabbage seedpod weevil larval exit
holes
Source: Saskatchewan Agriculture

The Saskatchewan Ministry of Agriculture
is seeking a highly motivated, results oriented
person for the position of:

Provincial Specialist, Cereal Crops

For details on the job description and how to
apply, go to:

<http://www.careers.gov.sk.ca>
and search for "AGR000258"

The closing date for the competition is Sept. 5, 2011.

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